

# MATERIAL SAFETY DATA SHEET

## 1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology  
Standard Reference Materials Program  
100 Bureau Drive, Stop 2300  
Gaithersburg, Maryland 20899-2300

SRM Number: 2647a  
MSDS Number: 2647a  
SRM Name: Propane in Nitrogen

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**Description:** This SRM mixture is supplied in a DOT 3AL specification aluminum (6061 alloy) cylinder with a water volume of 6 L. Mixtures are shipped with a nominal pressure exceeding 12.4 MPa (1800 psi), which provides the user with 0.73 m<sup>3</sup> (25.8 ft<sup>3</sup>) of useable mixture. The cylinder is the property of the purchaser and is equipped with a CGA-350 brass valve, which is the recommended outlet for this propane mixture. NIST recommends that this cylinder **NOT** be used below 0.7 MPa (100 psi).

**Substance:** Propane/Nitrogen Compressed Gas Mixture.

**Other Designations:** **Propane** (*n*-propane; dimethyl methane; propyl hydride; propylhydride; liquefied petroleum gas; LPG)/**Nitrogen** (dinitrogen) compressed gas mixture.

## 2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component	CAS Registry	EC Number (EINECS)	Concentration
Propane	74-98-6	200-827-9	2500 µmol/mol *
Nitrogen	7727-37-9	231-783-9	balance

\* Concentration applies to the identified NIST cylinder.

**Index, R/S Phrases (EU):** Refer to Section 15, "Regulatory Information".

## 3. HAZARDS IDENTIFICATION

**NFPA Ratings (Scale 0–4):** Health = 2 Fire = 0 Reactivity = 0

**Major Health Hazards:** Respiratory tract burns, skin burns, eye burns, allergic reactions, difficulty in breathing, suffocation.

**Physical Hazards:** Cylinder may rupture or explode if exposed to heat.

**Potential Health Effects (Short Term Exposure)**

**Inhalation:** Respiratory tract burns, skin burns, eye burns, allergic reactions nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma.

**Skin Contact:** Irritation, burns, frostbite.

**Eye Contact:** Irritation, burns.

**Ingestion:** Ingestion of a gas is unlikely.

## Listed as a Carcinogen/Potential Carcinogen

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	_____	<u>X</u>
In the International Agency for Research on Cancer (IARC) Monographs	_____	<u>X</u>
By the Occupational Safety and Health Administration (OSHA)	_____	<u>X</u>

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### 4. FIRST AID MEASURES

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**Inhalation:** If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration by qualified personnel. Get immediate medical attention. **Note to Physician:** For inhalation, consider oxygen.

**Skin Contact:** Wash affected skin with soap and water for at least 15 minutes while removing contaminated clothing. Get medical attention, if needed.

**Eye Contact:** Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

**Ingestion:** Ingestion of gas is unlikely.

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### 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Negligible fire hazard applicable to the identified NIST cylinder. Cylinder may rupture or explode if exposed to heat. Escaping gas mixture promotes combustion of surrounding materials.

**Extinguishing Media:** Regular dry chemical, carbon dioxide.

**Fire Fighting:** Move cylinder from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

**Flash Point (°C):** Not Applicable      **Autoignition (°C):** Not Applicable      **Method:** Not Applicable

**Flammability Limits in Air (Volume %): Upper:** Not Applicable

**Lower:** Not Applicable

**Flammability Class (OSHA):** Not applicable to the NIST identified cylinder.

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### 6. ACCIDENTAL RELEASE MEASURES

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**Occupational Release:** Stop leak if possible without personal risk. Isolate hazard area and deny entry. Stay upwind and keep out of low areas. Refer to Section 13, "Disposal Considerations".

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### 7. HANDLING AND STORAGE

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**Storage:** Store and handle in accordance with all current regulations and standards. Secure cylinder to prevent physical damage. Keep valve protective cap on cylinder when not in use. Keep separated from incompatible substances. Store in a well-ventilated area. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.

**Safe Handling Precautions:** Wear safety goggles. See Section 8, "Exposure Controls and Personal Protection".

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### 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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#### Nitrogen Gas

ACGIH (inhalation): simple asphyxiant

UK OES (inhalation): simple asphyxiant

#### Propane

OSHA TWA (inhalation): 1800 mg/m<sup>3</sup>

UK OES (inhalation): simple asphyxiant

**Ventilation:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Respirator:** If necessary, refer to the “NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84” for selection and use of respirators with organic vapor cartridges certified by NIOSH.

**Eye Protection:** Wear safety goggles. **DO NOT** wear contact lenses in the laboratory. An eye wash station should be readily available near of handling and use areas.

**Personal Protection:** Wear protective clothing and chemically resistant gloves to prevent skin exposure.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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Nitrogen	Propane
<b>Appearance and Odor:</b> colorless and odorless	<b>Appearance, Odor, Taste:</b> colorless, distinct odor
<b>Molecular Weight:</b> 28.01	<b>Molecular Weight:</b> 44.11
<b>Molecular Formula:</b> N <sub>2</sub>	<b>Molecular Formula:</b> C <sub>3</sub> H <sub>8</sub>
<b>Boiling Point (°C):</b> -196	<b>Boiling Point (°C):</b> -42
<b>Freezing Point (°C):</b> -210	<b>Freezing Point (°C):</b> -190
<b>Vapor Density (air = 1):</b> 0.97	<b>Vapor Density (air = 1):</b> 1.55
<b>Volatility (%):</b> 100	<b>Volatility (%):</b> 100
<b>Solubility in Water:</b> slightly soluble	<b>Solubility in Water (%):</b> very slightly soluble
<b>Solvent Solubility:</b> soluble in liquid ammonia; slightly soluble in alcohol	<b>Solvent Solubility:</b> soluble in alcohol; ether; benzene; chloroform; turpentine

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## 10. STABILITY AND REACTIVITY

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**Stability:** ☒ Stable ☐ Unstable

Stable at normal temperatures and pressure.

**Conditions to Avoid:** Avoid heat, flames, sparks and other sources of ignition. Avoid inhalation of material or combustion by-products. Protect from physical damage. Cylinder may rupture or explode if exposed to heat.

**Incompatibilities:** Metals, oxidizing materials, combustible materials.

**Fire/Explosion Information:** Refer to Section 5, “Fire Fighting Measures”.

**Hazardous Decomposition:** Thermal decomposition or combustion produces oxides of nitrogen and other miscellaneous products.

**Hazardous Polymerization:** ☐ Will Occur ☒ Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Entry:** ☒ Inhalation ☐ Skin ☐ Ingestion

### Nitrogen Gas

Compressed nitrogen gas is a simple asphyxiant.

### Propane

Propane gas is a simple asphyxiant.

**Health Effects (Acute Exposure):**

Inhalation of propane to 10,000 ppm caused no symptoms in human subjects. Asphyxia is the principal hazard. The symptoms of asphyxia depend on the rapidity with which the oxygen deficiency develops and how long it continues. In sudden acute asphyxia, unconsciousness may be immediate. With slow development, there may be rapid respiration and pulse, air hunger, dizziness, reduced awareness, tightness in the head, tingling sensations, incoordination, faulty judgment, emotional instability, and rapid fatigue. As the asphyxia progresses, nausea, vomiting, collapse, unconsciousness, convulsions, deep coma and death are possible.

**Target Organs:** Central nervous system (CNS).

**Medical Conditions Generally Aggravated by Exposure:** Respiratory disorders.

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**12. ECOLOGICAL INFORMATION**

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**Environmental Summary:**

No data available.

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**13. DISPOSAL CONSIDERATIONS**

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**Waste Disposal:** Dispose in accordance with all applicable federal, state, and local regulations.

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**14. TRANSPORTATION INFORMATION**

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**U.S. DOT and IATA:** Compressed Gas, N.O.S. (Propane in Nitrogen); UN1956; Hazard Class 2.2.

**Canadian Transportation WHMIS:** Compressed Gas, N.O.S. (Propane in Nitrogen); UN1956; Hazard Class 2.2.

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**15. REGULATORY INFORMATION**

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**U.S. REGULATIONS**

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21)

ACUTE: Yes

CHRONIC: No

FIRE: No

REACTIVE: No

SUDDEN RELEASE: Yes

**STATE REGULATIONS**

California Proposition 65: Not regulated.

**CANADIAN REGULATIONS**

WHMIS Classification: Not determined.

## EUROPEAN REGULATIONS

### EU Classification

Not determined for the identified NIST compressed gas cylinder.

### EU Risk and Safety Phrases

Not determined for the identified NIST compressed gas cylinder.

## NATIONAL INVENTORY STATUS

**U.S. Inventory (TSCA):** Listed.

**TSCA 12(b), Export Notification:** Not listed.

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## 16. OTHER INFORMATION

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**Sources:** MDL Information Systems, Inc., MSDS *Nitrogen*, 16 June 2005.

MDL Information Systems, Inc., MSDS *2-Components Mix Propane in Inert Gas*, 16 June 2005.

**Disclaimer:** Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.